REMARKS

1. Applicant has amended Figure 4 in accordance with the suggestion of the Examiner, to include the plurality of squaring stages. Figure 4 as originally filed showed the plurality of integrators as originally filed. Figure 4 as amended is included with this amendment. Applicant respectfully submits that Figure 4 as amended meets the requirements of the Examiner.

2. Applicant has amended the Abstract to limit the number of words to be one hundred and fifty (150). Applicant respectfully submits that the Abstract as amended meets the requirements of the Examiner.

3. Applicant has amended the claims to define the quantities M and N. As now written, the claims define the values of M and N and are believed to be definite.

4. Applicant has amended claims 43-50 to overcome the objections of the Examiner. As now written, claims 43-50 are believed to be definite.

5. Applicant has also amended the specification to correct informalities noted by applicant's attorney upon a further study of the application. Applicant has amended a number of the claims to correct informalities noted by applicant's attorney upon a further study of the claims. As now written, these claims are believed to be definite.

6. Claims 1-18, 21, 29-34, 43, 44, 47, 49, 51, 54-57 and 59 have been rejected under 35 U.S.C. 102 (b) as anticipated by Tanaka patent 5,781,542. As now written, claims 1-18, 21, 29-34, 43, 44, 47, 49, 51 and 55-60 are believed to be allowable over Tanaka for certain important reasons including the following:

a. Tanaka does not provide a parallel presentation of each of M data modulations in a sequence and N spreading codes in a sequence where M is the number of the data modulations in the sequence and N is the number of the spreading codes in the sequence. The Examiner appears to recognize this. For example, the Examiner states the following on pages 3 and 4 of the Office Action dated 10/30/2003.

> "Each signal is selectively modulated (column 5, lines 7-12) and then spread using one of the spreading codes (column 11, lines 50-52)." (Underlining supplied.)

By using the word "then," the Examiner appears to recognize that the data modulation and the spreading code in Tanaka are not in parallel. The Examiner has used the word "then" a number of times in discussing Tanaka on pages 3-15 of the Office Action.

Such claims as claims 1-8, 9-11, 28, 29-40, 43-50 and 51-60 recite this feature of the parallel presentation.

b. Tanaka does not select an individual one of the data modulations and an individual one of the spreading codes and combine the selected one of the data modulations and the selected one of the spreading codes. Applicant recites this relationship in such claims as 12-13.

c. Tanaka does not select an individual one of the M data modulations in each sequence of the data modulations and an individual one of N spreading codes in each spreading code sequence and combine the selected one of the M data modulations in each sequence of the data modulations and the selected one of the N spreading codes in each sequence of the spreading codes. This is recited by applicant in such claims as 2-5, 7, 14-20, 25-28, 51-54, 55.

d. Tanaka does not obtain the product of the selected one of the data modulations and the selected one of the spreading codes. This is recited by applicant in such claims as claims 8, 10-11, 27, 29-40 and 43-50.

e. Tanaka does not disclose the step of transmitting to the receiver the Combination, or the product, of the selected one of the data modulations and the selected one of the spreading codes. Applicant recites this feature in such claims as claims 2-4, 8, 10-11, 12-13, 15, 25-28, 29-40, 45-50, 51-54 and 57.

7. Claims 19, 20 and 22-24 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka patent 5,781,542 in view of Fulghum patent 5,3456,369. Claims 19 and 20 are respectively dependent from claims 16 and 18. Claims 16 and 18 are allowable over Tanaka for the reasons discussed in paragraph 6c. Claims 19 and 20 are allowable over Fulghum for the same reasons. This prevents Tanaka and Fulghum from being combined to reject claims 19 and 20.

Claims 22-24 are dependent from claim 21. Claim 21 is allowable over each of Tanaka and Fulghum because it recites the step of receiving at a receiver signals transmitted from the transmitter and constituting a combination of a selected one of the M data modulations in a data modulation sequence and a selected one of the N spreading codes in a spreading code sequence where M indicates the number of the data modulations in the data modulation sequence and N indicates the number of the spreading codes in the spreading code sequence. Claim 21 is also allowable over each of Tanaka and Fulghum because each fails to disclose the step of identifying, from the different combinations of M data modulations in the data modulation sequence and the selected one of the N spreading codes in the spreading code sequence, the combination of a selected one of the M data modulations in the data modulation sequence and the selected one of the N spreading codes in the spreading code sequence. Since each of Tanaka and Fulghum fail to disclose certain significant features recited in claim 21, they cannot be combined to reject claim 21. Claims 22-24 are allowable over the combination of Tanaka and Fulghum for the same reasons as claim 21 since they are dependent from claim 21.

8. Claims 25-28, 41 and 42 have been rejected as being unpatentable over Park patent 6,160,840 in view of Tanaka patent 5,781,542. As now written, claims 25-28, 41 and 42 are allowable over the combination of Park and Tanaka for certain important reasons.

Claim 25 is allowable over each of Park and Tanaka for the reasons set forth in paragraphs 6c and 6e. This causes claim 21 to be allowable over the combination of Park and Tanaka. Claims 26-28 are allowable over the combination of Park and Tanaka for the same reasons as claim 25 because they are dependent from claim 25. Because of the recitation in claim 27, claim 27 is also allowable over the combination of Park and Tanaka for the reasons set forth in paragraph 6d. Claim 28 is additionally allowable over the combination of Park and Tanaka for the reasons set forth in paragraph 6a because of the recitations in the claim.

Claim 41 recites that the modulated interleaved punctured data constitutes a product of modulated data selected from M data modulations and a spreading code selected from N spreading codes where M is the number of data modulations and N is the number of spreading codes. Neither Park nor Tanaka discloses this relationship. This causes claim 41 to be allowable over the combination of Park and Tanaka.

Claim 42 is dependent from claim 41 and is accordingly allowable over the combination of Park and Tanaka for the same reasons as claim 41. Claim 42 is also allowable over the combination of Park and Tanaka because it recites that the data received at the receiver from the transmitter constitutes a combination of a selected one of the M data modulations in a data modulation sequence and a selected one of the N spreading codes in a spreading code sequence

where M is the number of the data modulations in the data modulation sequence and N is the number of the spreading codes in the spreading code sequence. Claim 42 is additionally allowable over the combination of Park and Tanaka because it recites the step of identifying, from the M data modulations in each data modulation sequence and the N spreading codes in each spreading code sequence, the selected one of the M data modulations in the data modulation sequence and the selected one of the N spreading codes in the spreading code sequence, the identification occurring before the demodulation and despreading of the received data.

9. Claims 35-40, 45, 46, 48, 50, 52, 53, 58 and 60 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka patent 5,781,542 in view of Park patent 6,160,840. As now written, claims 35-40, 45, 46, 48, 50, 52, 53, 58 and 60 are allowable over the combination of Tanaka and Park for certain important reasons.

10. Claims 61-63 and 66 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka patent 5,781,542 in view of Lee patent 6,111,868. Claims 61-63 and 66 are allowable over the combination of Tanaka and Lee for certain important reasons. Claim 61 recites a bus for receiving transmitted data representing a combination of an individual one of M data modulations in a sequence and N spreading codes in a sequence juxtaposed to the sequence of the M data modulations. There is also a recitation in claim 61 of a plurality of filters disposed in a parallel relationship, each of the filters providing characteristics corresponding to a combination of a selective one of the M data modulations and a selective one of the N spreading codes and each being operative to receive the data on the bus and to provide an output dependent upon the matching between the characteristics of the filter and the characteristics of the data on

the bus. Neither Tanaka nor Lee discloses these features. Claim 61 is accordingly allowable over the combination of Tanaka and Lee. Since claims 62, 63 and 66 are dependent from claim 61, they are allowable over the combination of Tanaka and Lee for the same reasons as claim 61.

11. Claims 64, 65 and 67 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka patent 5,781,542 in view of Lee patent 6,111,868 and further in view of Park patent 6,160,840. Since claims 64, 65 and 67 are dependent from claim 61, they are allowable over the combination of Tanaka, Park and Lee for the same reasons as claim 61. Claim 67 is also allowable over the combination of Tanaka, Park and Lee because it is dependent from newly added claim 81 which recites that the combination of the selective one of the M data modulations and the selective one of the N spreading codes constitutes the product of the selective one of the M data modulations and the selective one of the N spreading codes.

Claims 35-40 are directly or indirectly dependent from claim 29. Claim 29 is allowable over the combination of Tanaka and Park for the reasons set forth in paragraphs 6a, 6d and 6e. Because of this, claim 35, 36 and 38 are allowable over the combination of Tanaka and Park for the same reasons as claim 29. In addition, claims 37, 39 and 40 are dependent from claim 30. Claims 37, 39 and 40 are additionally allowable over the combination of Tanaka and Park because claim 30 recites the step of identifying the product of the selected one of the M data modulations and the selected one of the N spreading codes in each parallel pair.

As previously indicated, claim 43 is allowable over Tanaka for the reasons specified in paragraphs 6d and 6e. Claim 43 is allowable over Park for the same reasons. Claims 45, 56, 48

and 50 are dependent from claim 43. This causes claims 45, 46 and 48 and 50 to be allowable over the combination of Tanaka and Park for the reasons specified in paragraphs 6d and 6e.

Claim 51 is allowable over Tanaka for the reasons specified in paragraphs 6c and 6e. Claim 51 is allowable over Park for the same reasons. Claims 52 and 53 are dependent from claim 51. As a result, claims 52 and 53 are allowable over the combination of Tanaka and Park for the reasons specified in paragraphs 6c and 6e.

Claim 55 is allowable over Tanaka for the reasons specified in paragraphs 6a and 6c. Claim 55 is allowable over Park for the same reasons. This causes claim 55 to be allowable over the combination of Tanaka and Park for the reasons specified in paragraphs 6a and 6c. Claims 58 and 60 are dependent from claim 55. As a result, claims 58 and 60 are allowable over the combination of Tanaka and Park for the reasons specified in paragraphs 6a and 6c.

12. Claims 61-63 and 66 have been rejected under 35 U.S.C./ 103(a) as being unpatentable over Tanaka patent 5,781,542 in view of Lee patent 6,111,868. Claim 61 is allowable over the combination of Tanaka and Lee for the reasons specified in paragraph 6c since neither references discloses the features specified in paragraph 6c. Claims 62-63 and 66 are dependent from claim 61. This causes claims 62, 63 and 66 to be allowable over the combination of Tanaka and Lee for the same reasons as claim 61.

13. Claims 68-70 and 73 have been rejected under 35 U.S.C. 103(a) as unpatentable over Tanaka patent 5,781,542 in view of Lee patent 6,111,868 and Fulghum patent 5,345,469. There is a recitation in claim 68 of a bus for receiving transmitted data representing a combination of an individual one of M data modulations in a sequence and N spreading codes in a juxtaposed sequence and a plurality of multipliers each constructed to combine the transmitted data and an individual one of the spreading codes to provide an output representative of the combination. None of the references discloses these features. This causes claim 68 to be allowable over the combination of Tanaka, Lee and Fulghum. Claims 69, 70 and 73 are dependent from claim 69 and are accordingly allowable over the combination of references for the same reasons as claim 69.

14. Claims 71, 72 and 74 have been rejected under 35 U.S.C. 103(a) as unpatentable over Tanaka patent 5,781,542 in view of Lee patent 6,111,868 and further in view of Fulghum patent 5,345,469 in view of Park patent 6,160,840. Since claims 71, 72 and 74 are dependent from claim 68, they are allowable over the references for the same reasons as claim 68 as specified above in paragraph 13.

15. Claims 75-97 have been added by this amendment. Claims 75-83 constitute claims dependent from claims included in the application as originally filed. Claims 75-82 are allowable over the prior art for the reasons discussed in detail above. Claims 84-97 are similar to claims discussed above except that they recite M data modulations and a single spreading code. These claims are allowable over the prior art for the reasons discussed in detail above.

16. Please charge the costs of this amendment to account No. 06-2425

17. Reconsideration and allowance of this application are respectfully requested.

IN THE ABSTRACT:

Data at a transmitter is modulated, in accordance with instructions from a receiver, to provide M different modulations in successive sequences. N spreading codes are also provided in successive sequences at the transmitter, in accordance with instructions from the receiver, alternately with the M data modulations. The alternate sequences of the M data modulations and the N spreading codes are paired and individual ones of the M data modulations and the N spreading codes in the paired sequences are combined (e.g. multiplied). ~~Alternatively, an individual one of the M data modulations is combined (e.g. multiplied) with an individual one of the N spreading codes in the adjacent sequence. The modulator and the spreader may be included at the transmitter with (a) a channel encoder which provides channel coding in accordance with instructions from the receiver, (b) a puncturer which removes particular data in accordance with instructions from the receiver and (c) an interleaver.~~ The paired combinations of the individual ones of the M data modulations and the N spreading codes are transmitted to the receiver, which uses correlation or matched filter techniques to recover each combination of the individual one of the data modulations and the individual one of the spreading codes. ~~The recovered data is de-spread in accordance with instructions from the receiver, demodulated in accordance with instructions from the receiver and de-interleaved. The particular data punctured~~

~~from the sequence is re-inserted and the data is then decoded in accordance with the instructions from the receiver.~~ A single spreading code may be used instead of the N spreading codes.

Respectfully submitted,

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